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## Imaging

### NET RECLASSIFICATION IMPROVEMENT OF CARDIOVASCULAR RISK IN PATIENTS WITH NORMAL MYOCARDIAL PERFUSION IMAGING USING HEART RATE RESPONSE TO VASODILATOR STRESS

ACC Moderated Poster Contributions

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**Background:** Patients with normal myocardial perfusion imaging (MPI) are at low risk for hard cardiac events. The purpose of this study was to assess the improvement in risk classification provided by heart rate response (HRR, % change from baseline) to adenosine and regadenoson in patients with normal vasodilator MPI when added to traditional risk stratification.

**Methods:** We studied 1,000 consecutive patients each with normal regadenoson and adenosine MPI. Traditional risk stratification was performed using Adult Treatment Panel III (ATPIII) framework into low (< 6%), intermediate (6 - 20%), and high (> 20%) risk categories. Patients were further stratified by HRR into tertiles specific to each vasodilator (regadenoson <21%, 21-37% and >37% and for adenosine, <16%, 16-32% and >32%). The outcomes were all-cause mortality and major adverse cardiac events (MACE, cardiac death or non-fatal MI). Follow-up was censored at 2 years from MPI.

**Results:** During follow-up, 106 (11%) and 130 (13%) patients died and MACE occurred in 21 (2%) and 33 (3%) patients in regadenoson and adenosine groups, respectively. Patients who died had a higher Framingham Risk Score ( $12 \pm 4$  vs.  $11 \pm 4$ ,  $p = 0.009$ ) and lower HRR ( $22 \pm 16$  vs.  $32 \pm 21$ ,  $p < 0.0001$ ). In a Cox hazard model that controlled for age, gender, ejection fraction, and ATPIII category, HRR in the lowest tertile was associated with increased risk of mortality and MACE for both regadenoson (HRs 2.4 [95%CI 1.6 - 3.5] and 4.3 [95%CI 1.6 - 11.7], respectively) and adenosine (HRs 2.5 [95%CI 1.8 - 3.6] and 4.2 [95%CI 1.9 - 9.5], respectively,  $p$  for all < 0.01). Notably, blunted HRR was associated with worse outcome across all 3 risk categories. When added to ATPIII categories, HRR resulted in net reclassification improvement in mortality of 21.5% ( $p < 0.0001$ ) and MACE of 15.4% ( $p = 0.3$ ) for adenosine group, and 17.6% ( $p = 0.003$ ) in mortality and 35.6% ( $p = 0.005$ ) in MACE for regadenoson group.

**Conclusion:** A blunted HRR to vasodilator stress is independently associated with increased risk of cardiac events in patients with normal vasodilator MPI. The addition of HRR makes it possible to identify patients with normal vasodilator MPI who are at very low risk.